STATE OF MONTANA JOB DESCRIPTION

Montana state government is an equal opportunity employer. The State shall, upon request, provide reasonable accommodations to otherwise qualified individuals with disabilities.

Job Title: Communications Technologist

Working Title: Communications Technologist

Position Number: 44001, 44005, 44006, 44009**,** 44010, 44012, 44014, 44015, 41028, 41036

Pay Band: 6

Division and Bureau: Maintenance/Communication

Job Code Number: 492236

Section and Unit:

Location: Various Locations

FLSA Status: ☒**Non-Exempt** ☐ **Exempt**

Description of the Work Unit:
The Maintenance Division Program provides for repairs and preventive maintenance of state highways, secondary highways, and the various signs, traffic control devices, and structures within the highway right-of-way. The division is made up of the Equipment Bureau; Communication Bureau; Facilities Bureau; Motor Pool; Maintenance Management System; Maintenance Review; State Sign Shop; Maintenance Support Services; MDT's Disaster and Emergency Services; and MDT's Noxious Weed Program.

The Communications Bureau coordinates all engineering, installation, and maintenance for: MDT land mobile communication systems including all two-way mobile and portable radios, relays, and base stations, and MDT's remote weather information systems (RWIS). The Communications Bureau assists in the design, installation, and maintenance of the local and wide area computer networks; the land line telecommunication systems utilized throughout the Department; the permanent and portable variable message signs (VMS) used across the state; the statewide fuel systems for MDT owned fuel sites; and the traffic signal and roadway lighting systems within the state maintained highway right-of-way. The Bureau also manages and oversees the cell phones, smartphones, and satellite phones utilized by MDT personnel.

Job Overview:
The Communications Technologist is responsible for managing the installation, engineering, maintenance and repair of mobile radio communication systems, the RWIS, IT computer/network systems, telecommunications systems, fueling network and gauging systems, and other technical electronic communication, monitoring and accessory equipment to ensure optimum performance, longevity and public safety. This involves troubleshooting a wide variety of diverse, complex equipment and interconnected systems using methodical analysis and specialized diagnostic equipment to independently identify and resolve problems/issues within assigned area of the state. Duties also include

planning, coordinating, and directing the design, installation, expansion, and operation of various MDT communication, warning and monitoring systems and related equipment as directed under remote supervision. This includes coordinating and directing district personnel and contractors, projects and communications to ensure smooth and efficient system operations that meet the communication needs of the MDT. These duties often include direct oversight of contractors during the installation of new communications sites, RWIS sites and during construction of new facilities involving telecommunications and networking. This position does not directly supervise other staff and reports to the Communications System Engineer.

Essential Functions (Major Duties or Responsibilities): *These job functions are the essential duties of the position and are not all-inclusive of all the duties the incumbent may be assigned.*

A. Communications Systems Management, Maintenance & Repair 65% of Time

Manage installation, engineering, maintenance and repair of mobile radio communication systems, the RWIS, IT computer/network systems, telecommunications systems, fueling network and gauging systems, and other technical electronic communication, monitoring and accessory equipment to ensure optimum performance/functionality, longevity and public safety. This involves troubleshooting a wide variety of diverse, complex equipment and interconnected systems using methodical analysis and specialized diagnostic equipment to independently identify and resolve problems/issues within assigned area of the state.

1. Manage, install, test, program and maintain components, system design, complex electrical systems, electrical circuits, computerized functions including microprocessors, and mechanical equipment associated with land mobile radio communications for the MDT and other state and federal agencies to ensure fully operational intra and inter communications are available to conduct safe and effective operations. Research, evaluate and implement new technologies and modify existing equipment to meet emerging needs. Plan, design, and execute or oversee on-site construction.

2. Diagnose, repair, reconstruct and perform adjustments to land mobile/portable communications equipment using technological analysis, specialized diagnostic equipment and principles of troubleshooting in order to isolate and resolve obstacles/issues which can hinder reliable land mobile communications (both mobile and stationary) in locations that may be remote and difficult to access especially in inclement weather. Evaluate problems using engineering schematics, electronic theory, and radio communication principles to identify and fix faulty parts which minimizes repair costs of circuit card or equipment replacement that would otherwise be outsourced. Check frequencies, solve interference problems and make necessary adjustments to comply with new laws such as federal regulations that narrow the banding MDT is permitted to utilize. Devise work-arounds, new methods and techniques to resolve problems involving numerous variables in many different, electrical and mechanical components by devising individualized, sometimes unique, solutions as the first line expert technician to maintain vital communication links in assigned area.

3. Perform continuous evaluations to improve the land mobile communication systems and assist with design and strategic placement of antennas, base stations, relays, transceivers and other equipment based on careful analysis of factors influencing effective radio reception/transmission. Utilize specialized computer software to program, interconnect, align, and diagnose microprocessor-based equipment used in land mobile communications equipment.

4. Install, operate, maintain and assist in the design phase of the RWIS to ensure current road and weather conditions recorded at strategic locations are available to MDT personnel and the traveling

public. Monitor and repair data collection equipment on site and remotely to ensure information is transmitted appropriately via standard communication protocols (phone lines, cellular connectivity, and computer networks) in order to improve response times to emergencies, increase winter maintenance efficiency and minimize the traveling public's exposure to hazardous weather affecting roadway conditions.

5. Install, maintain, and perform operational analysis on the emergency lighting, land mobile radio, and video recording systems for Motor Carrier Services (MCS) vehicles and within the MCS scale facilities. Ensure all equipment is installed in accordance with manufacturer's specifications and recommendations. Install video surveillance systems within MDT facilities to enhance safety and monitor for vandalism/theft. Design, modify and install the equipment to overcome unforeseen obstacles due to new and emerging technologies not previously encountered.

6. Install, maintain, troubleshoot and repair permanent and portable VMS equipment to ensure the travelling public is informed of road conditions, emergencies, detours, etc. in a timely manner to maintain the safety of the public and any MDT personnel working on roadways and bridges.

7. Manage and oversee the communications shop containing a large inventory of components, tools and equipment used to maintain, diagnose and repair complex integrated communications systems including but not limited to radio technology, computers and software, remote gauging systems, telecommunications, cellular and wireless technology. Prioritize work schedules based on analysis and MDT policies and procedures and track and/or procure necessary tools, electronic components, software, and other items needed to keep all communications systems operating at optimum capacity.

8. Oversee, coordinate, and maintain information technology including computer network and system implementations by analyzing, troubleshooting and resolving problems to ensure compatibility with agency wide systems and requirements to support essential data transfers regarding highway construction and maintenance activities to and from all area offices across the state. Manage the performance and placement of departmental computer local area networks (LAN) and the wide area networks (WAN); develop network plans, designs, and computer network wiring using functional analysis of the proposed network plans and understanding of the network capabilities; utilize sophisticated network tools and test equipment to test network performance and ensure data transmission throughout the entire network. This includes developing integration strategies between current and future systems; serving as liaison with department staff and external personnel (e.g. contractors, vendors); providing direction and information to department staff; coordinating service, equipment procurement and implementation; and remaining current on emerging technologies and the potential effectiveness of these advancements in their current system.

9. Manage divisional telecommunication systems, develop divisional telecommunication network plans and make recommendations concerning the most appropriate implementation strategies to ensure effective inter and intra telecommunications and to meet clientele obligations. Maintain or restore performance of telecommunications systems including but not limited to; PBX telephone systems and solid state voice messaging systems for road and construction reports.

10. Manage the placement, submit design proposals and sustain the reliable performance/integrity of the statewide automated fuel gauging/dispensing and tank monitoring systems to ensure efficient accountability and billing of fuel distribution by identifying and resolving technical issues/problems and performing necessary calibrations in accordance with system specifications. Install inter-system

wiring, terminals, site controllers, and point of sale terminals, used for controlling fuel pumps and information transfer of data. Using computer software, program site specific parameters and link the system to the nationwide fueling network. Operate complex test equipment and password protected security diagnostic features to resolve system failures.

11. Perform various maintenance, engineering, placement, troubleshooting and repair activities to ensure optimal performance of other electronic, electrical, and electromechanical equipment unrelated to telecommunications equipment to support the safety of the public on roadways, persons with weather sensitive activities, and employees of the department. This includes, but is not limited to, National Weather Service transmitters, data collection and transmission equipment, Traveler Information Systems (TIS), automated hazard equipment, emergency lighting and siren equipment, distance measuring devices, Federal Aviation Administration (FAA) non-directional beacon navigation devices, cellular phone equipment and new equipment often unique and unprecedented. Analyze equipment capabilities and design specifications and system restrictions to determine if equipment meets the needs of clientele.

12. Sustain necessary wireless telecommunication services and equipment across the state. Provide support to ensure the department's statewide interactive video conferencing system and the computer software used in programming and diagnosing these systems is working effectively.

13. Act as liaison and main point of contact between the Communications Bureau Chief, the Communications Systems Engineer, MDT staff, contractors, vendors, agents of local, state and federal organizations and other interested parties to share knowledge regarding the inter-relationships of all communication applications supported by the MDT and the Communications Bureau. Coordinate and collaborate as appropriate on any issues related to communications in assigned area. Provide technical expertise in the consideration of equipment needs and concerns and provide assistance as needed.

14. Assist the traffic signal technicians with monitoring and maintaining, signalized intersections and luminaires to ensure the safety of the public and MDT staff. Repair or replace lights as needed or ensure the proper maintenance crews are informed and scheduled to make these repairs.

B. Communications System Design and Construction Oversight 25% of Time

Under direction and remote supervision, plan, organize, coordinate, and direct the design, installation, expansion, and operation of various MDT communication, warning and monitoring systems and related equipment. This includes coordinating and directing projects, district personnel, contractors, and communication between all parties to ensure smooth and efficient system operations that meet the communication needs of the MDT.

1. Plan, organize and direct the design, installation, expansion and operation of the MDT communication systems and related equipment; establish and monitor project time lines and priorities; ensure public safety radio functions comply with established laws, codes, ordinances, rules, regulations, policies and procedures.

2. Design, develop and present concepts and system layouts to the Communications Bureau Chief or the Communications Systems Engineer. Provide expertise, fundamental data and resources to management relating to substantiating the advantages and disadvantages of large-scale departmental projects.

3. Coordinate, direct and make general project decisions and confer with MDT staff, contractors and vendors to ensure the department's interests have been satisfied and to properly and timely resolve system issues, problems and malfunctions. Monitor projects by directing contract employees and departmental employees on accomplishing large technical projects within established time parameters.

4. Act as a technical liaison between the Communications Bureau, contractors and department personnel regarding the design and development of new control systems, new site locations, and equipment specifications of buildings, towers and utilities. .

5. Research new replacement materials estimating monetary benefits and dependability and ensure appropriate procedures specified by Federal Communications Commission rules and regulations and departmental policies have been followed so that agencies serviced are not in violation.

6. Oversee the preparation and distribution of data, schematics, correspondence and information materials related to the public safety radio communication system; develop network documentation and schematic diagrams for future reference and ensure proper maintenance of required Federal Communications Commission licenses.

7. Generate new ways of configuring systems and aligning inter-system parameters in order to save the department time and revenue. Develop solutions to correct problems as they arise; research, evaluate and provide recommendations concerning new technologies and equipment.

C. Other Duties as Assigned 5% of Time

This position performs a variety of other duties as assigned by the Communications Bureau Chief or the Communications Systems Engineer in support of the department mission and bureau objectives including but not limited to; initiating equipment transfers and data entries concerning divisional communications equipment, preventative maintenance inventory and schedules; providing analytical expertise in answering questions regarding job related divisional problems; making decisions that align with the bureaus mission and objective; maintaining divisional logs, equipment calibration cycles, divisional interagency frequency authorization records, and weekly work schedules and progress reports; researching and procuring necessary materials and parts for equipment repair and readiness; researching and writing bid specifications for the purchase of new equipment needed to sustain the departments statewide networks and present them to supervisors for approval; providing training and education to personnel; travelling in and out of state to project locations and conferences and meetings; coordinating special projects; and related duties as assigned.

Supervision

If this incumbent supervises others, please list each employee supervised and the position number:
This position does not directly supervise other staff.

Minimum Qualifications (Education and Experience):

The required knowledge, skills and abilities are typically acquired through a combination of an associate's degree in electronics, telecommunications, construction technology or related field plus three (3) years of technical experience specific to land mobile radio communication including project development, system installation and working familiarity with various systems and network designs. Other equivalencies will be considered.

Other education, training, certification, or licensing required (specify):

Retain recognized professional certification in the field of telecommunications, such as a general class Federal Communications Commission (FCC) Radio Telephone Operators License, or Association of Public safety and Communications Officials (APCO).

Required Knowledge, Skills, and Abilities

This position requires knowledge in land mobile radio communication and telecommunication methodologies, principles and practices including analyzing problems and providing solutions; the Federal Communications Commission (FCC) rules and regulations; local, state and federal policies; and specifications and guidelines as they apply to the needs of the agencies serviced. Also required is knowledge of the principles of electrical/electronics engineering with emphasis on land mobile radio communications and telecommunications; installation, maintenance and repair of specialized digital and analog electronic equipment used within the industry; principles and practices associated with WAN's, LAN's and the ability to apply aspects of network design; state and federal laws related to traffic devices, and working knowledge of the Manual of Uniform Traffic Control Devices, the National Electrical Code, and standards from the National Electrical Manufacturers Association.

This position requires skill in the use of complex electronic equipment including system analyzers, spectrum analyzers, time domain reflectometers, miniature electronics soldering/desoldering equipment, local area network analyzers, computers and associated software packages used in the design, programming, diagnostics and maintenance of complex electronic and communications systems. Also required are motorized vehicle handling skills including operating four-wheel drive pickups, ATVs, and snowmobiles in unstable terrain and specialized safety skills needed for erecting, climbing and performing installation of antennas on towers.

This position requires the ability to analyze complex communication, telecommunication and electrical systems; perform work activities under periodic stressful situations; be away from home for consecutive weeks at a time; travel alone in excess of 25,000 (twenty five thousand) miles annually, using various modes of transportation including (but not limited to) snow shoes, snowmobiles, ATVs, four wheel drive pickups, horseback, and helicopter under normal to extremely adverse weather conditions in order to access critical sites located in populated or remote mountain top locations. Also required is the ability to lift or move heavy objects (120 pounds), including electronic equipment and snowmobiles; place radios and other electronic devices in vehicles and equipment which requires all types of lifting and maneuvering in cumbersome positions and restrictive spaces such as under dashes and in trunks; safely climb towers and utility poles and work at heights in excess of 300 (three hundred) feet for long periods of time in all types of weather conditions.

Special Requirements:

List any other special required information for this position

☐	Fingerprint check	☒	Valid driver's license
☒	Background check	☐	Other; Describe

The specific statements shown in each section of this description are not intended to be all inclusive. They represent typical elements and criteria considered necessary to perform the job successfully.

Signatures

My signature below indicates the statements in the job description are accurate and complete.

Immediate Supervisor	**Title**	**Date**

Manager	**Title**	**Date**

My signature below indicates that I have read this job description.

Employee	**Title**	**Date**

Human Resources Review

My signature below indicates that Human Resources has reviewed this job description for completeness.

	HR Manager	
Signature	**Title**	**Date**